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EXAMINER

UHLIR, NIKOLAS J

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 04/05/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

T-P-8

Office Action Summary

Application No.

09/581,447

Applicant(s)

MURATA ET AL.

Examiner

Nikolas J. Uhler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant in claim two requires "An anti reflection material as recited in claim 1, wherein said polymer is a copolymer copolymerizing a urethane methacrylate compound." In claim 1 the applicant requires that the hard coat layer consist of a polymer polymerizing a methacrylate compound having a fluorene structure. It is unclear to the examiner whether the applicant in claim two is requiring that the fluorene methacrylate polymer of claim one be replaced with a copolymer of a urethane acrylate, or whether the applicant is requiring that the methacrylate group on the fluorene structure be replaced with a urethane methacrylate group, resulting in a urethane methacrylate with a fluorene structure. Clarification is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 2, 6-10, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Oka et al. (US5747152).

6. For the purpose of this examination, the examiner has assumed that claim two requires an antireflection material comprising a transparent substrate, a hard coat layer provided on one or two surfaces of the transparent substrate, and an antireflection film having a lower refractive index than the hard coat layer provided on the surface of the hard coat, wherein the hardcoat consists of a copolymer of at least a urethane methacrylate compound **and does not require** a fluorene structure. Pages 22-24 of the specification support this embodiment.

7. Oka et al. teaches an antireflection film comprising a transparent substrate, a hard coat formed on the transparent substrate, and a secondary coating deposited on the hard coat layer, wherein the secondary coating has a lower refractive index than the hard coat layer (column 11, line 45-column 13, line 65). The transparent substrate is typically a film of tri-acetyl cellulose, di-acetyl cellulose, polyester, or poly acrylic (column 13, lines 10-22). The hard coat comprises a resin containing ultra fine particles having a high refractive index, and the secondary coating comprises a low refractive index resin containing particles having a low refractive index, or simply a layer made of an inorganic material having low refractive index (column 12, lines 1-13). Oka et al. teaches that UV curable resins containing acrylate functional groups are suitable for use as the binder resin for the hard-coat layer. Urethane acrylates are preferred (column 13, lines 23-25 and column 13, lines 48-51). A Material such as poly vinylidene fluoride is

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suitable for use as a low refractive index binder (column 30, lines 22-25). Oka et al. defines "ultrafine particles" as particles having an average diameter not more than 200nm, preferably between 5-70nm (Column 12, lines 17-22). Examples of particles having high refractive index used in the hard coat layer are ZnO ($n=1.9$), and TiO_2 ($n=2.3-2.7$) (column 11, lines 55-67, and column 21, lines 59-67). Examples of materials having low refractive index used in the secondary layer include LiF ($n=1.4$), MgF_2 ($n=1.4$), AlF_3 ($n=1.4$), and particles thereof (column 12, line 13 and column 22, lines 50-55). The ultrafine particles may optionally be coated with a layer of colloidal silica to render them highly hydrophobic (column 12, lines 36-44). Although Oka et al. does not explicitly state that the antireflection material has a surface tension less than 20 dynes/cm, the materials stated by Oka et al for use as the secondary layer (MgF_2 or LiF) exactly match the materials specified by the applicant on page 35 of the specification as suitable secondary layer materials which possess this property. Thus, the examiner takes the position that this limitation is necessarily met. Lastly, Oka et al. teaches a polarizing plate that comprises a polarizing element that has been adhesively bonded to the underside of the antireflection film as stated above. The polarizing element is typically a polyvinyl alcohol or polyvinyl acetal film that has been colored with iodine or a dye and stretched (column 31, lines 21-37).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka et al. in view of Kawasato et al. (JP08-056398).
10. For the purpose of this examination the examiner has relied upon a translation of the Kawasato et al. document to form the basis for this rejection. An official translation will be attached when it is received.
11. Oka et al. as stated above teaches all of the limitations of claims 1 and 3-5, except for those limitations listed below.
12. Oka et al. does not teach an anti-reflection material comprising a transparent substrate, a hard coat layer, and an anti reflection film having a lower refractive index than the hard coat layer, wherein the hard coat layer consists of a polymer polymerizing at least a methacrylate compound having a fluorene structure.
13. Kawasato et al. teaches an acrylate resin compound that exhibits reduced yellowing when exposed to weathering and heat (section 004). The structure of this acrylate resin matches chemical formula #2 stated by the applicant on page 11 of the specification. These resins are used as coatings for optical materials, particularly as hard coatings (section 002). Further, these materials exhibit high moisture and thermal resistance, as well as high adhesion to substrates (Section 003). In addition, this material is typically radiation cured (section 0045).
14. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to use the acrylate resin taught by Kawasato et al. as the hard coat binder used in Oka et al.

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15. One would have been motivated to make this modification due to the fact that Oka et al. teaches that photocurable resins containing acrylate functional groups can be used as the binder for the hard coat layer. In addition, one would have been motivated to make this modification due to the fact that the Kawasato materials are known for being used as hard coat layers in optical materials, and possess high heat and moisture resistance.

16. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oka et al. in view of Morita (US4735869)

17. Oka et al. as stated above teaches all of the limitations of claim 11, except for those listed below.

18. Oka et al. does not teach using rutile titanium oxide that has been coated with an oxide of silicon, zirconium, aluminum, tin, or cesium as a filler in an anti reflection material.

19. Morita teaches that rutile type titanium dioxide has a higher refractive index than anatase type titanium dioxide.

20. Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to use the rutile titanium dioxide as the ultrafine particles used in the hardcoat layer taught in Oka et al.

21. One would have been motivated to make such a modification due to the higher refractive index of rutile titanium dioxide one would expect to gain as opposed to anatase type titanium dioxide.

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22. The examiner acknowledges that neither Oka et al. nor Morita explicitly states that rutile type titanium dioxide is suitable for use in antireflection materials. However, Oka et al. discloses a range of refractive indices for ultrafine TiO_2 in column 21, lines 63-64, indicating that the refractive index chosen is variable. Morita shows that rutile type TiO_2 can achieve a higher refractive index than anatase TiO_2 . Thus, there is motivation to use rutile TiO_2 as opposed to anatase TiO_2 when very high refractive index is required in the hard coat layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhler whose telephone number is 703-305-0179. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on 703-308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0389.

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April 3, 2002

Paul Thibodeau
Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700